

REMARKS

The Final Office Action mailed January 14, 2003, has been received and reviewed. Claims 9 through 18, 20 through 23, and 42 through 45 are currently pending in the application. Claims 9 through 18, and 20 through 23 stand rejected. Applicant proposes to amend claims 9 through 14, 16 through 18, 20, 21 and 44, and respectfully request reconsideration of the application as proposed to be amended herein.

Election of Species Requirement

Claims 42 through 45 are withdrawn from consideration as being drawn to a non-elected invention. Applicant herein acknowledges the election of species in the above-referenced application, and affirms the election by original presentation to prosecute claims 9 through 18, and 20 through 23, without further traverse.

Applicants consider claim 9 to be generic, and note that upon allowance of a generic claim, claims depending therefrom in a non-elected species would also be allowable.

35 U.S.C. § 112 Claim Rejections

Claims 9 through 18, and 20 through 23 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant respectfully traverses this rejection, as hereinafter set forth.

The Office asserts that the specification does not provide support for the claim 9 limitation of “a substrate configured for operably connecting said IC device to at least one other IC device mounted on said substrate or at least one electrical component mounted on said substrate.” Applicant respectfully disagrees with this assertion, as such a substrate is clearly depicted in FIG. 15 of the specification by reference numeral 1060 and is described in detail at page 2, paragraph [0002] and page 18, paragraph [0065] of the specification.

While it is believed that all the limitations of claim 9 in its present form are sufficiently described in the specification, Applicant proposes to amend the cited limitation in claim 9 to

recite “a substantially planar substrate bounded by a first substantially planar surface and an opposing, second substantially planar surface and having at least one conductive trace.” This amendment to claim 9 does not add any new matter and is supported in the specification by FIGS. 4 through 11, 15 and 16 and by the disclosure at page 10, paragraph [0039].

In view of the foregoing, Applicant respectfully submits that claim 9, as proposed to be amended, is allowable under the provision of 35 U.S.C. § 112, first paragraph.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,229,320 B1 to Haseyama et al.

Claims 9 through 12, 14 through 16, 18, and 20 through 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haseyama et al. (U.S. Patent No. 6,229,320 B1). Applicant respectfully traverses this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

Haseyama et al. discloses an IC socket 200 mounted on a test board 32 and having a contact unit 23 including a plurality of contact pins 30 for engaging solder bumps 28 on an IC device 25. Contact unit 23 may include various features such as elastic member 31, 31A, positioning plate 36 with recesses 38, positioning parts 52A, 53A or guide plates 41 and 42 for retaining contact pins 30 and positioning of solder bumps 28 (Figs. 7-19). Haseyama et al. further discloses that contact pins 30 may have a spiral part 63 for contacting solder bumps 28 (Figs. 21A-21B and col. 15, lines 31-53). The opposite ends of contact pins 30 pass out of the underside of the socket body 21 and are configured to connect to land parts 33 on test board 32, or in the alternative, to have elastically deformable parts 71, 72, 73 inserted into through holes 70

in test board 32.

In rejecting claims 9 through 12, 14 through 16, 18, and 20 through 22, the Office indicates that Haseyama et al. discloses a substrate comprised of test board 32 combined with structural elements of IC socket 200 mounted on test board 32. Specifically, the Office indicates the substrate comprises the combination of test board 32, a contact unit 23 and a positioning plate 36. (See Haseyama et al., Figs. 10 and 11.) Claim 9, as proposed to be amended, recites the limitation of “a *substantially planar* substrate bounded by a first substantially planar surface and an opposing, second substantially planar surface and having at least one conductive trace.” (Emphasis Added.) Applicant respectfully submits that Haseyama et al. does not teach or suggest this limitation. Rather than being substantially planar, the substrate cited by the Office as being disclosed in Haseyama et al. is configured such that contact unit 23 and positioning plate 36 are mounted to, and project above, the surface of test board 32.

Moreover, as proposed to be amended, claim 9 recites the limitations of “an aperture including a seat portion opening onto said first substantially planar surface of said substantially planar substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substantially planar substrate.” The IC sockets disclosed in Haseyama et al. do not teach or suggest an aperture including a seat portion and a retaining portion formed within a substantially planar substrate. Instead, the aperture cited by the Office comprises structural features combined from the stacked assembly of test board 32, contact unit 23 and positioning plate 36. Specifically, the Office cites through holes 35 and positioning recesses 38 of positioning plate 36 as being analogous to the seat portion recited in claim 9, and through holes 70 of test board 23 as being analogous to the retaining portion recited in claim 9. These structural features are not formed within a substantially planar substrate, and do not disclose the limitation of a retaining portion “having a first end connected to an opposing end of said seat portion.”

Finally, the limitations of claim 9 indicate that the aperture “seat portion”, the aperture “retaining portion” and the “at least one conductive trace” are all structural features of the same substantially planar substrate. As discussed above, the substrate cited by the Office as being disclosed in Haseyama et al. is a combination of three separate structural elements that are not

substantially planar in form.

In view of the above, Applicant respectfully submits that claim 9, as proposed to be amended, is allowable over Haseyama et al. under the provisions of 35 U.S.C. § 103.

The nonobviousness of independent claim 9 also precludes a rejection of claims 10 through 12, 14 through 16, 18, and 20 through 22, which depend therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. See *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), see also MPEP § 2143.03.

Further, claim 10 recites that “said second end of said retaining portion does not extend entirely through said substantially planar substrate to said opposing, second substantially planar surface.” In rejecting claim 10, the Office cites Fig. 9 of Haseyama et al., which shows the aperture does not extend all the way through test board 32. However, Fig. 9 of Haseyama et al. illustrates a test socket embodiment wherein contact pins 30 are configured to connect to land parts 33 on test board 32, rather than being inserted into through holes 70 in test board 32. Since the Office has already cited through holes 70 as being analogous to the claimed aperture, the test socket embodiment of Haseyama et al. using land parts 33 cannot be combined to reject claim 10.

Claim 15 and claims 16 and 18, in depending therefrom, recite “a volume of conductive filler material disposed in and filling at least a partial *depth* of said aperture.” (Emphasis added.) Applicant respectfully submits that Haseyama et al. does not disclose any conductive filler material filling a partial depth of an aperture, but instead is limited to disclosing a through hole 70 (See Haseyama et al., column 17, lines 1-63.)

In view of the above, Applicant respectfully submits that claims 10 through 12, 14 through 16, 18, and 20 through 22 are also allowable over Haseyama et al. under the provisions of 35 U.S.C. § 103.

Obviousness Rejection Based on U.S. Patent No. 6,229,320 B1 to Haseyama et al. in View of Patent Application Publication US 2002/0075025 A1 to Tanaka

Claims 13 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haseyama et al.(U.S. Patent No. 6,229,320 B1) in view of Tanaka (Patent Application Publication US 2002/0075025 A1). Applicant respectfully traverses this rejection, as hereinafter set forth.

Tanaka teaches a semiconductor testing tool having a socket casing 2 with internal lead wires 8 (Figs. 1 and 3). The internal lead wires 8 are assertedly obvious to combine with the substrate of Haseyama et al. to beneficially reduce the number of structural elements of the test tool.

Claims 13 and 17 depend from claim 9. Claim 9, as proposed to be amended herein, recites the limitations of “a substantially planar substrate bounded by a first substantially planar surface and an opposing, second substantially planar surface and having at least one conductive trace” and “an aperture including a seat portion opening onto said first substantially planar surface of said substantially planar substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substantially planar substrate.” Moreover, claim 9 indicates that the aperture “seat portion”, the aperture “retaining portion” and the “at least one conductive trace” are all structural features of the same substantially planar substrate.

For the same reasons as described above, neither Haseyama et al. nor Tanaka, alone or as combined, teach these limitations. Accordingly, claims 13 and 17, in depending from claim 9, are allowable over the cited references under the provisions of 35 U.S.C. § 103.

Claim 17 also depends from claim 15, which recites the limitation “a volume of conductive filler material disposed in and filling at least a partial depth of said aperture.” Applicant respectfully submits that neither of the cited references teach or suggest this limitation, and that claim 17 is allowable for that reason as well.

Obviousness Rejection Based on U.S. Patent No. 6,229,320 B1 to Haseyama et al. in View of JP 2000-123935 to Kawaguchi

Claim 23 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Haseyama et al.(U.S. Patent No. 6,229,320 B1) in view of Kawaguchi (JP 2000-123935). Applicant respectfully traverses this rejection, as hereinafter set forth.

Kawaguchi teaches a test socket 1 for electronic parts having contact pins 20 with spiral coil springs 20a having two or more coil turns (see Abstract). The Office indicates it would be obvious to use two or more coil turns for the spring contacts of Haseyama et al. to prevent damage and provide better contact with the solder bumps.

Claims 23 depends from claim 9. Claim 9, as proposed to be amended herein, recites the limitations of “a substantially planar substrate bounded by a first substantially planar surface and an opposing, second substantially planar surface and having at least one conductive trace” and “an aperture including a seat portion opening onto said first substantially planar surface of said substantially planar substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substantially planar substrate.” Moreover, claim 9 indicates that the aperture “seat portion”, the aperture “retaining portion” and the “at least one conductive trace” are all structural features of the same substantially planar substrate.

For the same reasons as described above, neither Haseyama et al. nor Kawaguchi, alone or as combined, teach these limitations. Accordingly, claim 23, in depending from claim 9, is allowable over the cited references under the provisions of 35 U.S.C. § 103.

Drawings

For the same reasons as discussed above with respect to the rejections under 35 U.S.C. § 112, first paragraph, Applicant respectfully submits that the drawings show every feature of the invention specified in the claims. Accordingly, Applicant respectfully requests that the objection to the drawings under 37 C.F.R. § 1.142(b) be withdrawn.

Applicant has filed herewith new formal drawings including revised FIGS. 1 and 2 with the legend “PRIOR ART” as previously proposed and as approved by the examiner.

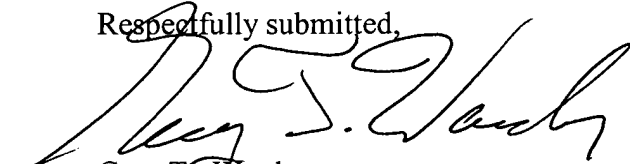
ENTRY OF AMENDMENTS

The proposed amendments to claims 9 through 14, 16 through 18, 20, 21 and 44 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. If the Examiner determines that the amendments do not place the application in condition for allowance, entry is respectfully requested upon filing of a Notice of Appeal herein.

CONCLUSION

Claims 9 through 18, 20 through 23 and 42 through 45 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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Date: February 13, 2003

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Enclosure: Version With Markings to Show Changes Made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

9. (Twice Amended) A device for establishing electrical contact with a lead element extending from an IC device, comprising:

a substantially planar substrate bounded by a first substantially planar surface and an opposing,

second substantially planar surface and having at least one conductive trace [configured for operably connecting said IC device to at least one other IC device mounted on said substrate or at least one electrical component mounted on said substrate];

a spring contact including a base portion and a contact portion, said contact portion comprising a resiliently compressible coil spring configured to bias against and electrically contact said lead element of said IC device; and

an aperture including a seat portion opening onto [one surface] said first substantially planar surface of said substantially planar substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substantially planar substrate, said seat portion of said aperture configured to at least partially contain said contact portion of said spring contact and said retaining portion of said aperture configured to receive and electrically [contact] connect said base portion of said spring contact to said at least one conductive trace.

10. (Twice Amended) The device of claim 9, wherein said second end of said retaining portion does not extend entirely through said substantially planar substrate to said opposing, second substantially planar surface.

11. (Amended) The device of claim 9, further comprising a layer of conductive material disposed on at least a portion of an interior wall of said aperture, said layer of conductive material electrically [contacting] connecting said base portion of said spring contact to said at least one conductive trace.

12. (Amended) The device of claim 11, wherein said [layer of conductive material is electrically connected to a] at least one conductive trace is formed on said [one] first substantially planar surface of said substantially planar substrate.

13. (Amended) The device of claim 11, wherein said [layer of conductive material is electrically connected to] at least one conductive trace is formed within an intermediate conductive plane of said substantially planar substrate.

14. (Twice Amended) The device of claim 11, wherein said retaining portion of said aperture extends through said substantially planar substrate and opens onto [an] said opposing, second substantially planar surface of said substantially planar substrate and said [layer of conductive material is electrically connected to a] at least one conductive trace is formed on said opposing, second substantially planar surface of said substantially planar substrate.

16. (Amended) The device of claim 15, wherein said conductive filler material is electrically connected to [a] said at least one conductive trace [formed on said one surface] of said substantially planar substrate.

17. (Amended) The device of claim [15] 16, wherein said [conductive filler material is electrically connected to] at least one conductive trace is formed within an intermediate conductive plane of said substantially planar substrate.

18. (Twice Amended) The device of claim [15] 16, wherein said retaining portion of said aperture extends through said substantially planar substrate and opens onto [an] said opposing, second substantially planar surface of said substantially planar substrate and said [conductive filler material is electrically connected to a] at least one conductive trace is formed on said opposing, second substantially planar surface of said substantially planar substrate.

20. (Twice Amended) The device of claim 9, wherein said second end of said retaining portion [opening] opens onto [an] said opposing, second substantially planar surface of said substantially planar substrate.

21. (Twice Amended) The device of claim 9, wherein said seat portion comprises a generally hemispherical recess formed in said [one] first substantially planar surface of said substantially planar substrate, a generally conical recess formed in said [one] first substantially planar surface of said substantially planar substrate, or a generally cylindrical recess formed in said [one] first substantially planar surface of said substantially planar substrate.

44. (Amended) The device of claim 9, further comprising a clamping element configured to secure said IC device to said first substantially planar surface of said substantially planar substrate.